EXHIBIT A

PATENT

Docket No. E040004USU1 **Serial No.** 11/231,349

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:
Brett Bernath et al.

Serial No.: 11/231,349

Filed: September 19, 2005

For: A BROADBAND LOCAL AREA NETWORK

Group Art Unit: 2423

Confirmation No. 4520

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: **James Leija**
Examiner

Dear Sir:

In response to the Final Office Action of March 3, 2009, please note the following remarks and comments:

Amendments to the Claims begin on page 2 of this paper.

Remarks/Comments begin on page 8 of this paper.

I hereby certify that this correspondence is being electronically deposited with the Commissioner for Patents through the USPTO electronic filing system, on:

July 2, 2009
(Date of Deposit)
Tim Ellis
(Name of Person Making Deposit)
/Tim Ellis/
(Signature)

AMENDMENTS TO THE CLAIMS:

What is claimed is:

1. (Currently amended) A Broadband Coaxial Network ("BCN"), comprising:

a first BCN modem in signal communication with a coaxial cable network ("CCN"), the first BCN modem including a first controller; and

another BCN modem in signal communication with the CCN that is capable of two-way signal communication with the first BCN modem across one or more passive network devices having high isolation in the CCN, the another BCN modem including a second controller,

wherein each of the first and second controllers are configured to probe at least one respective communication link connecting that controller directly to at least one other BCN modem and to adjust transmission power and bit loading over the at least one respective communication link based on a result of the probe.

2. (Previously prsented) The BCN of claim 1, wherein the first controller establishes the first BCN modem as a network controller upon connection to the CCN, the network controller configured to manage data transmission between each of the BCN modems connected to the CCN.

3. (Original) The BCN of claim 2, wherein a control signal is generated by the first BCN modem in response to the first BCN modem being a network controller.

4. (Previously presented) The BCN of claim 1, wherein the second controller is configured to detect a control signal that identifies a network controller is coupled to the CCN.

5. (Original) The BCN of claim 1, wherein the signal communication occurs between the BCN modems that are located within a building.

6. (Original) The BCN of claim 5, wherein the building is a single family home.

7. (Original) The BCN of claim 5 wherein the building is a multi-unit dwelling unit.

8. (Previously presented) The BCN of claim 1, wherein the signal communication occurs via a Time Division Multiple Access (TDMA) access scheme on one or more Radio Frequency (RF) channels.

9. (Original) The BCN network of claim 1, wherein the signal communication carries encrypted data between the first BCN modem and the other BCN modem.

10. (Previously presented) A Broadband Coaxial Network ("BCN") for communicating on an in-building coaxial cable network ("CCN"), comprising:

a first BCN modem connected to a coaxial cable network ("CCN") and included in a plurality of BCN modems in the BCN network, the first BCN modem including a controller having communication links to ones of the plurality of BCN modems and configured to manage data transmission between each of the BCN modems in the BCN network; and

another of the plurality of BCN modems connected to the CCN and capable of signal communication with the first BCN modem across one or more passive network devices having high isolation in the CCN, the another BCN modem including a second controller having communication links to ones of the plurality of BCN modems,

wherein the first BCN modem and the another BCN modem are configured to communicate with each other utilizing TDMA and Time Division Duplex (TDD), and wherein each of the controllers is configured to periodically probe each of their communication links to other BCN modems and to adjust transmission power over each of the communication links based on the probe through orthogonal frequency division multiplexing (OFDM) and bit-loading.

11. (Original) The BCN of claim 10, wherein the first BCN modem employs adaptive communication techniques that adapts to the characteristics of a coaxial channel between the first BCN modem and the other BCN modem.

12. (Previously presented) The BCN of claim 10, wherein the first BCN modem is directly in signal communication with the other BCN modem across the CCN.

13. (Original) The BCN of claim 12 wherein the CCN is a type of network having an architectural configuration selected from a group consisting of a star configuration and a mesh configuration and a combination of these configurations, in a TDMA, TDD access fashion, and the type of network utilizes at least one frequency channel.

14. (Previously presented) The BCN of claim 11, wherein the adaptive communication techniques includes utilization of the adaptive communication techniques in both transmitting processing and receiving processing of data.

15. (Original) The BCN of claim 14, wherein the adaptive communication techniques utilize pre-coding for transmitting processing.

16. (Original) The BCN of claim 14, wherein the adaptive communication techniques utilize adaptive equalization for receiving processing.

17. (Original) The BCN of claim 14, wherein the adaptive communication techniques include pre-coding for transmitting processing based on known or learned channel response.

18. (Original) The BCN of claim 14, wherein additional signal processing techniques are used which are selected from a group consisting of OFDM bit-loading, transmit power control, transmission diversity, OFDM cyclic prefix, and probes.

19. (Original) The BCN of claim 14, further including additional MAC and communication processing including the provision of best effort and reserved communication services, processes and protocol adaptations to adapt other communication services to operate over the BCN.

20. (Original) The BCN of claim 19, wherein the communication services and processes includes utilization of a Network Controller ("NC") to control the access to the BCN.

21. (Original) The BCN of claim 20, wherein the NC includes a configuration selected from the group consisting of:

a configuration that enables every BCN modem to act as a NC:

a configuration that utilizes a frequency plan;

a configuration that allows a new BCN modem admission to the BCN Network;

a configuration that allows a new BCN modem to communicate with another BCN modem to characterize the channel response between them and determine a bit loading in either direction; and

a configuration that allows each BCN modem in the network to request and be granted a transmission opportunity without a transmission conflict.

22. (Original) The BCN of claim 21, wherein the communications services provided by the BCN include BCN wide transmission priorities.

23. (Original) The BCN of claim 22, wherein the BCN services include a configuration that provides reserved bandwidth communication services.

24. (Original) The BCN of claim 19, wherein the BCN modem provides a protocol adaptation layer for communication over the BCN, the protocol adaptation layer utilizes protocols selected from the group consisting of:

Ethernet,

IEEE 1394,

Universal Serial Bus ("USB"); and

MPEG-TS.

25. (Original) The BCN of claim 11, wherein the BCN modem is embedded as a part of a device selected from the group consisting of:

a set-top box ("STB");

a Personal Computer (PC);

an IP STB;

a Media Center box;

a Media Extender box;

a DVD player;
a cable modem;
a personal video recorder ("PVR");
a TV set;
a networking device;
a switch/router;
a bridge/Gateway;
a video game console;
a wireless access point (WAP); and
a network attached storage.

26. (Currently Amended) The BCN of claim [[25]] 11, wherein the BCN modem [[STB]] is a device selected from the group consisting of a satellite STB, cable STB, and DSL STB.

27. (Original) The BCN of claim 25, wherein the BCN modem utilizes the PCI bus structure.

28. (Original) The BCN of claim 27, wherein the BCN modem utilizes another host device.

29. (Original) The BCN of claim 28, wherein the host device is either a bridging host device or a switching host device.

30. (Original) The BCN of claim 10, wherein an at least one TDMA frequency channel used by the BCN network is in one or more of the following frequency bands:
above 860 MHz;
between 860 MHz and 950 MHz; and
below 50 MHz.

31. (Original) The BCN of claim 10, wherein the CCN network is one of the following:
coaxial cables that have been installed for the carriage of satellite signals; and
coaxial cables for video distribution.

32. (Previously presented) A network device, comprising:

a communication interface configured to connect to a broadband coaxial network ("BCN"); and

a controller in signal communication with the communication interface, the controller configured to:

periodically probe a communication link to another network device to determine a characteristic of the communication link;

use orthogonal frequency division multiplexing and bit-loading to adjust transmissions over each communication link based in part on the probe; and

manage data transmission between each network device connected to the BCN.

REMARKS/ARGUMENTS

Claims 1-32 were pending in the application. Claims 1-32 were rejected. Claims 1 and 26 have been amended herein. Accordingly, Claims 1-32 are currently pending. Applicants respectfully request reconsideration and allowance of all pending claims. In the alternative, Applicants respectfully request that the Examiner enter the present amendment which places the application in better condition for appeal.

Discussion of Rejections Under 35 U.S.C. §103(a)

Claims 1-3, 5, 6, 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No. US 2002/0166124) and Baranowski (U.S. Pat. No. 7,486,648) and Kubler (Pub No US 2004/0174841).

The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the communication of Dinwiddie by using one or more passive network devices having high isolation in the CCN as taught by Gurantz in order provide a path for terminal devices to transmit to and receive from other terminal devices. However, the Examiner acknowledges that Dinwiddie is silent on the first BCD modem including a first controller; and the "another BCN modem" including a second controller, wherein each of the first and second controllers are configured to probe at least one respective communication link connecting that controller directly to at least one other BCN modem and to adjust transmission power over the at least one respective communication link based on a result of the probe. Nonetheless, the Examiner contends, Baranowski teaches the element of a first and second controller to probe at least one respective communication link between the first and second modems, this being an element missing from the combination of Dinwiddie and Gurantz.

The Examiner particularly points to the fact that Baranowski in fig 5 element 401 illustrates that each access point has a controller and modem. The Examiner further recites that this is detailed at Column 7 lines 48-54. The Examiner further supports this contention by stating that Baranowski teaches that each of the first and second controllers are configured to probe at least one respective communication link connecting that controller directly to at

least one other BCN modem. The Examiner points to Column 6 line 46 -column 7 line 4 and to Column 8 lines 48 - 64 of Baranowski to support this contention.

Applicants respectfully traverse the Examiner's rejection of Claim 1 for the following reasons. While Baranowski teaches a modem for communication with another wireless modem over power lines, and further teaches that the modems have a "controller", there is nothing in Baranowski that teaches or suggests that the controller is **used to probe at least one respective communication link connecting that controller directly to at least one other BCN modem**. Rather, what Baranowski teaches at column 6, lines 46 through column 6, line 48 is:

> …an alternative implementation of an access point that connects into an existing wired network that uses power-line modems and an AC power line for connectivity.

Baranowski (col. 6, line 49-59) goes on in this section to say:

> As shown in FIG. 3, personal computers (310, 312) and peripheral (320) are all networked using existing power-line networking technology in the form of power-line modems (344, 346, 348). All messages for any devices on the network (e.g., 320, 310, 312, 314 and 330) are broadcast on the power line (301), and each power-line modem (e.g., 340, 342, 344, 346, 348) ignores all messages except the ones intended for its device or a device wireless communicating with an access point (300, 302) connected to that power-line modem (340, 342). The intended recipient device of a message is defined by the internet protocol, such as TCP/IP.

Baranowski then says in Column 6, line 60 through Column 7, line 4 that:

> As in the previous figures, the **portable device (330) and personal computer (314) wirelessly communicate with access points (300) and (302) respectively**. The access points (300, 302) receive the wireless messages from the portable device (330) and personal computer (314) and broadcast them to the power-line network (301) through power-line modems (342) and (340) respectively. Any messages that are intended for the portable device (330) are

> received by power-line modem (342) and broadcast by access point (300) to the portable device (330). Any messages intended for personal computer (314) are received by power-line modem (340) and broadcast by access point (302) to the personal computer (314). (Emphasis added).

Accordingly, not only is the configuration of the architecture completely different, but nowhere in this passage (or anywhere else in Baranowski) is there a teaching or suggestion to have **controllers in modems probe the communications link** between the modems.

The requirement to establish a *prima facie* case of obviousness requires that the prior art reference, or references when combined, must provide **all of the claim limitations** and must establish that it would be **obvious for one of ordinary skill in the art to combine** the references in a way that would successfully result in the claimed invention.

In this case, the Examiner has failed to provide a reference that teaches or suggests the use of **controllers that probe the communication link** between modems in the first place, but then **even more importantly**, to use **information gathered from such probes** to adjust the power of the communications over such a link.

The Examiner also contends that Kubler teaches adjusting transmission power over at least one respective communication link based on a result of the probe, citing page 17, paragraph 0254. However, while Kubler teaches using a "HELLO" message received by a mobile device to determine whether the power with which the transmitter is sending the message was sent is set appropriately, there is no mention of use of a probe with which a controller probes the communication link.

The Examiner also cited Bell (U.S. Pat. No. 6,052,380) with regard to Claim 10. While Bell discloses characterizing a channel and using DMT modulation based upon the characterization, Bell is used in a far different environment. That is, it would not be obvious to use the technique disclosed by Bell in a coaxial cable network. That is because Bell disclosed the use in a wireless environment. In wireless, it is common for there to be substantial multipath conditions that would change and cause there to be a need for

monitoring the characteristics of each frequency channel to load each such channel appropriately.

However, in **broadband coaxial cable networks**, components typically communicate through a stable environment in which the signal that arrives in a home network from a service provider is routed through splitters to each of the components in the coaxial cable network that reside within the home. Accordingly, each component is coupled to the output of one such splitter. These splitters typically are know to have substantial isolation between the output ports, so that signals that are transmitted back to the splitter by a component of the coaxial cable network and that reside in the home will need to be amplified by an active device in order to allow the signal to make it through the splitter to other components of the network residing in the home. This creates a stable environment in which there is no need to use DMT modulation. In fact, there has been a long felt, but unresolved need for a broadband system that allows components to communicate without the need for an active device in the network to overcome the isolation of the splitters used in the coaxial cable wiring of a typical home.

The need for such service has always been provided by the use of the active device which amplifies and creates a stable environment. The introduction of the techniques disclosed by Gurantz allowed the elimination of the active device, which was not previously contemplated. However, Gurantz does not teach or suggest the problems that accompany this technique, i.e., the distortion that comes from having signals reflecting back into the network, such as creating standing waves that generate nulls in the frequency spectrum. Accordingly, it would not have been obvious to one of ordinary skill in the art to combine the currently recited architecture with the use of probes to characterize the channel and pre-coding techniques, such as bit-loading and or adjusting the power, as supported by the fact that there existed a long felt, but unresolved need. As noted by the U.S. Supreme Ct. in *KSR v. Teleflex, 550 U.S. 398, 127 S. Ct. 1727, 167 L. Ed. 2d 705 (2007)* and in *Graham v. John Deere Co., 383 U.S. 1, 5, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966)*, there are secondary considerations that need to be considered when determining obviousness, including whether there existed a long felt, but unresolved need for the solution posed by the combination that constitutes the invention at issue.

Accordingly, Applicants respectfully traverse the Examiner's rejection of Claim 1 and those claims that depend therefrom, including Claims 2-32.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US 2002/0166124) and Baranowski (U.S. Pat. No. 7,486,648) and Kubler (Pub No US 2004/0174841) and Bell (U.S. Pat. No. 6,052,380). Applicants respectfully traverse the Examiner's rejection of Claim 4 for the reasons set forth above with respect to Claim 1, from which Claim 4 depends.

Claim 7 was rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US 2002/0166124) and Baranowski (U.S. Pat. No. 7,486,648) and Kubler (Pub No US 2004/0174841) and El Wardani et al. (Pub. No.: US 2003/0031191). Applicants respectfully traverse the Examiner's rejection of Claim 7 for the reasons set forth above with respect to Claim 1, from which Claim 7 depends.

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US 2002/0166124) and Baranowski (U.S. Pat. No. 7,486,648) and Kubler (Pub No US 2004/0174841) and Droge (Pub No.: US 2002/0004898). Applicants respectfully traverse the Examiner's rejection of Claim 9 for the reasons set forth above with respect to Claim 1, from which Claim 9 depends.

Claims 10-15, 17-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US 2002/0166124) and Bell (U.S. Pat. No. 6,052,380). Applicants respectfully traverse the Examiner's rejection of Claims 10-15, 17 and 18 for the following reasons. As noted above, while Bell discloses the use of DMT modulation in a wireless environment, the use of such modulation (and bit-loading in particular) is not obvious in the broadband coaxial cable network that is recited in Claim 10 and the claims that depend therefrom. Accordingly, Applicants respectfully request that the Examiner reconsider the rejections of Claims 10-15, 17 and 18. Alternatively, Applicants respectfully request that the Examiner enter the amendments made herein as they place the application in better condition for appeal.

Claims 16 and 25-31 were rejected under 35 U.S.C. 103(a) as being unpatentable over

Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US2002/0166124) and Bell (U.S. Pat. No. 6,052,380) and El Wardani et al. (Pub. No.: US 2003/0031191). Applicants respectfully traverse the Examiner's rejection of Claims 16 and 25-32 for the reasons provided above with respect to Claim 10 from which each of these claims depends. With respect to Claim 26, the Examiner noted that Claim 26 is not positively captured within Claim 25, since Claim 26 modifies an alternative. Applicants have amended Claim 26 to depend from Claim 11 and to directly modify the BCN Modem recited in Claim 11.

Claims 19-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dinwiddie et al. (U.S. Pat. No. 6,481,013) and further in view of Gurantz et al (Pub No.: US 2002/0166124) and Bell (U.S. Pat. No. 6,052,380) and Gorman et al. (U.S. Pat. No. 6,137,793). Applicants respectfully traverse the Examiner's rejection of Claims 19-24 for the reasons stated above with regard to Claim 10 and in light of the fact that each of these claims depend from Claim 10.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bell (6,053,380) and further in view of Dinwiddie et al. (6,481,013). Applicants respectfully traverse the Examiner's rejection of Claim 32 for the reasons stated above with regard to Claim 1.

CONCLUSION

Applicants believe that all claims pending in the application are now allowable. Applicants therefore respectfully request that a timely Notice of Allowance be issued in this case. Alternatively, Applicants respectfully request that this amendment be entered as it places the application in better condition for appeal.

This is a response to the Final Office Action mailed on March 3, 2009, and as such, is submitted together with a request for a 1 month extension of time and the fee required for such a 1 month extension of time.

If there are any other fees due in connection with the filing of the response, please charge the fees to our Deposit Account No. 50-4613. If a fee is required for an extension of time under 37 CFR 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned.

Respectfully submitted,

Dated: July 2, 2009

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